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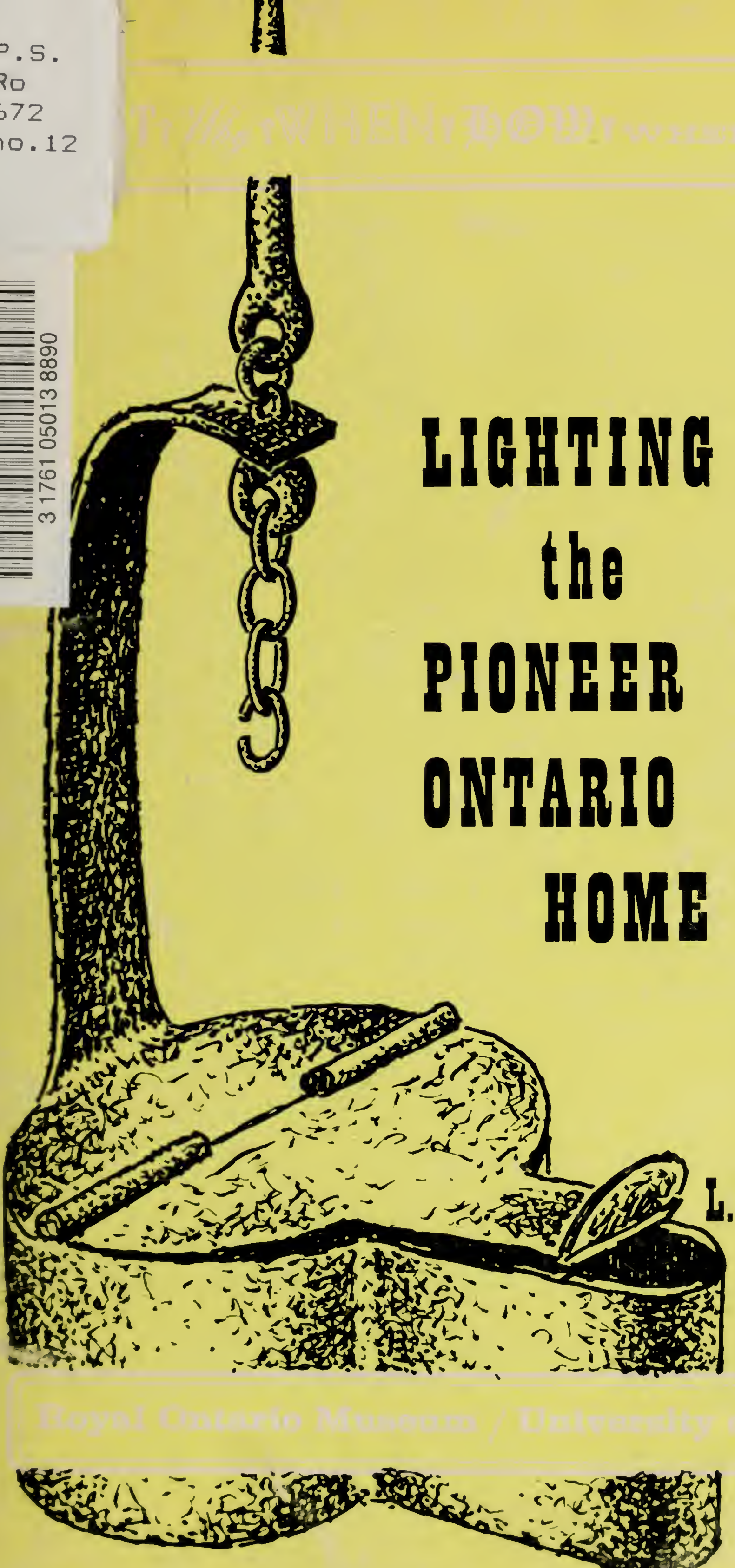

LIGHTING the PIONEER ONTARIO HOME

L. S. RUSSELL

Royal Ontario Museum / University of Toronto

I keep six honest serving-men
(They taught me all I knew);
Their names are WHAT *and* WHY *and* WHEN
And HOW *and* WHERE *and* WHO.

RUDYARD KIPLING

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11 *A. D. Tushingham:* THE BEARDMORE RELICS: HOAX OR HISTORY?
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13 *Gerald Stevens:* EARLY ONTARIO FURNITURE
14 *K. B. Brett:* WOMEN'S COSTUME IN ONTARIO (1867–1907)

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WHAT? HOW?
Why? WHERE?
WHEN? WHO?

Lighting the Pioneer Ontario Home

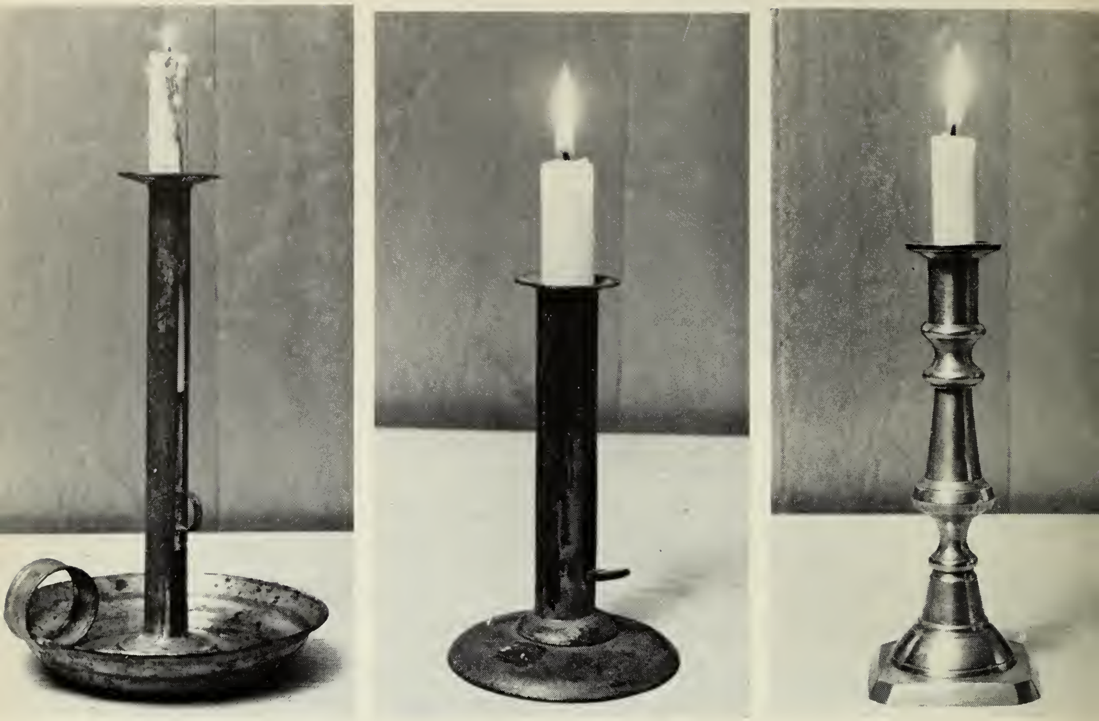
by LORIS S. RUSSELL

HOW did the first settlers light their homes?

Seven years before the colony of Upper Canada was born in 1791, man had already made the breakthrough to modern illumination. An obscure Swiss physicist and chemist, Ami Argand, patented the first scientifically designed lamp in 1784. But to the settlers around the shores of Lake Ontario, the new age in lighting meant little. The United Empire Loyalists who came from the newly created United States of America, and the administrative officials sent out from the British Isles, brought lighting devices that had changed little for centuries.

The pioneers must have depended for much of their lighting on the open fireplace. An essential part of every house, the only source of warmth and means of cooking, the fireplace would provide a flickering light sufficient for most evening activities in a home where man worked from sunrise to sunset. If light were needed in an obscure corner or for a brief excursion out of doors, a pine stick kindled in the blaze would serve as a temporary torch.

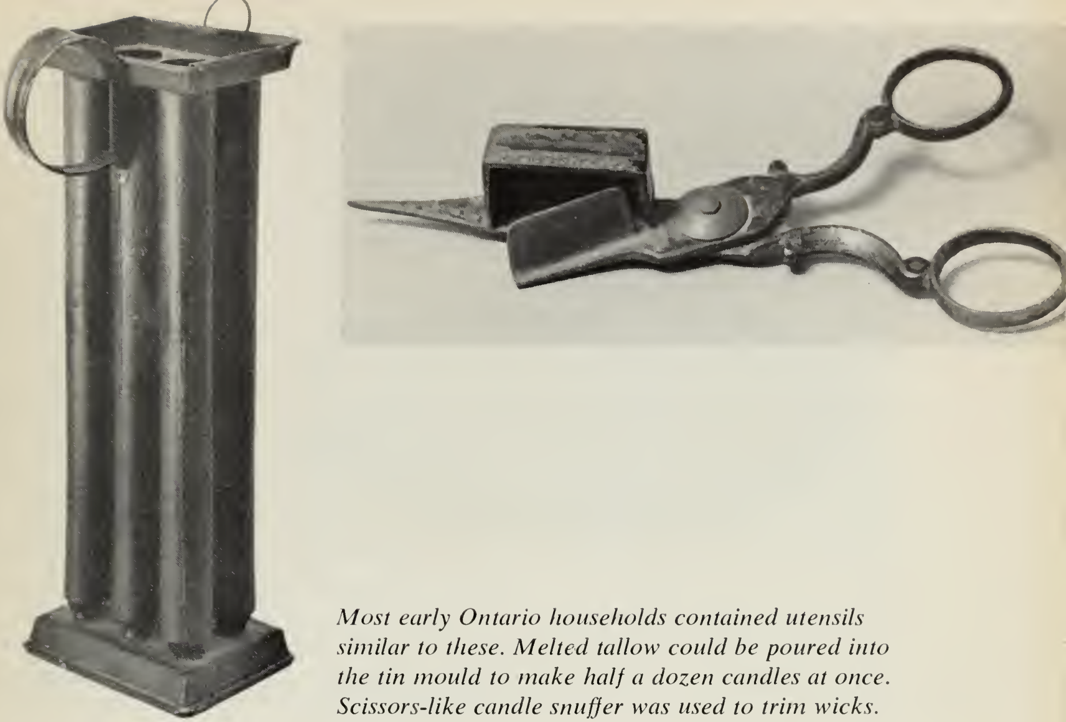
When a separate, lasting light source was required, the pioneer most often used a candle. Candles were developed in the early Middle Ages from the taper, a rope dipped in wax or grease. By the late 1700s, nearly all



Pioneer candleholders were simple and economical. LEFT *Many contained a vertical piston which could be pushed up or down as required so as to raise or lower the candle, thus providing support while guaranteeing that as little as possible of the stub would be left unburnt. The tallow candle in this photograph has guttered badly.* CENTRE *While most holders had saucer-shaped bases, on some the base was concave. These were called hog-scrapers because of their resemblance to a tool used in scraping the hide of a slaughtered pig.* RIGHT *The true candlestick was a tall, slender holder, usually of turned brass. It was as much ornamental as useful, and not likely to have been found in the settler's home. More ostentatious candelabra, with sockets for many candles, were restricted to a few wealthy houses and public halls.*

candles were made of tallow, which is the clarified fat of sheep or cattle. The fat was heated to separate it from the fibrous matter and poured off while still fluid.

The settlers in Upper Canada brought with them two techniques for making tallow candles. In either case the first step was to twist cotton into string-like wicks. In the first method, these wicks were tied at intervals to a stick so as to hang down in a row. Using the stick as a horizontal handle, the wicks were dipped into a pot of melted tallow, then hung to cool between the backs of chairs or other convenient supports. After the first

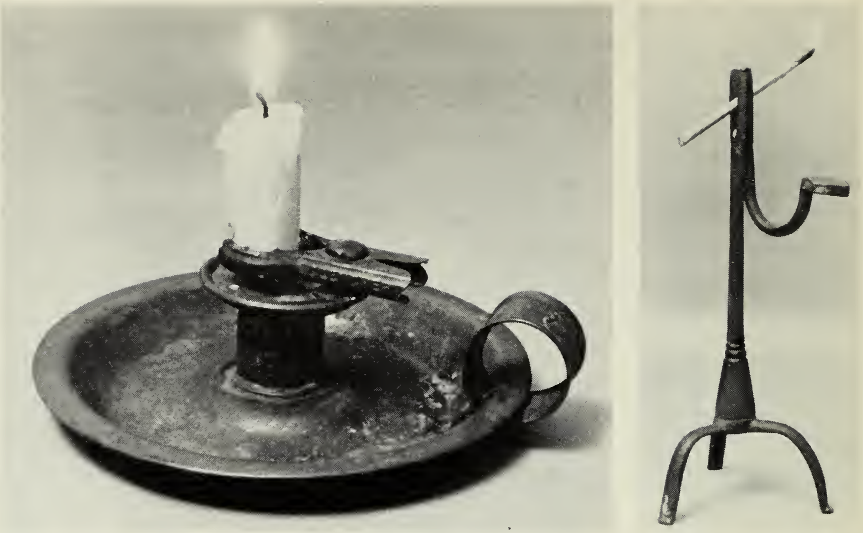


Most early Ontario households contained utensils similar to these. Melted tallow could be poured into the tin mould to make half a dozen candles at once. Scissors-like candle snuffer was used to trim wicks.

two or three dips the wicks were straightened by pulling. From then on it was just a matter of timing the dipping so as to allow the wax to cool well between each immersion. Eventually the rod of wax around the wick would be thick enough to support itself and function as a candle.

Probably more settlers made their candles by the second method, using moulds. These moulds were sets of tin or pewter tubes, tapering slightly from the open top to the cone-shaped bottom, the tip of which was perforated by a small hole. The wicks were first threaded through these holes, knotted, and drawn tight by looping over a stick at the top. Then each tube was filled with melted tallow, which was allowed to cool and solidify. Before the candles were drawn out, they had to be loosened by pouring a little hot water over the tubes. For use, of course, the candle would be turned over; the conical end became the top, and the loop of wick projecting from the bottom was cut off.

Tallow candles were cheap, and could be made from domestic products, but they had several disadvantages. The tallow had a tendency to soften and bend over, especially in warm weather, and while this could be overcome by adding beeswax, camphor, or alum to the tallow, these substances were not always available. Being an animal fat, moreover, tallow was likely to be eaten by mice or other domestic pests, and the candles had to



LEFT *Unusual candleholder is a monument to pioneer frugality and ingenuity. The candle will burn until all the tallow is used and the clamp jaws come together. In ordinary holders of the period, the flame usually guttered out with an inch or more of stub remaining.* RIGHT *A length of common rush, peeled and dipped in grease, provided a dim but inexpensive light.*

be kept in a closed container, usually a round tin box called a candle safe. The worst fault of tallow candles was a tendency to melt unevenly when burning, forming channels called gutters through which the liquid fat could run off. Also the wicks were likely to retain unburned carbon, which would cut down the brightness of the flame. If a piece of this carbon, called snuff, fell onto the rim of the candle, it would cause deep guttering. To prevent these difficulties most households had a candle snuffer, shaped something like a pair of scissors, with which the carbon could be snipped from the wick and removed.

Professional candle makers operated in the towns, and some may have gone the rounds of the farms like weavers and tinkers, but from the large number of candle moulds that have survived we can assume that most households poured their own tallow candles. Only with the advent of spermaceti and other waxes did candle-making become a commercial industry. Spermaceti is a wax derived from the oil in the head of the sperm whale. Most of it came from the New England fishermen, and for a time nearly all of the spermaceti candles used in North America were made in factories in Massachusetts. These candles were imported to Nova Scotia in the 1820s, and probably a few reached Upper Canada via New York State.

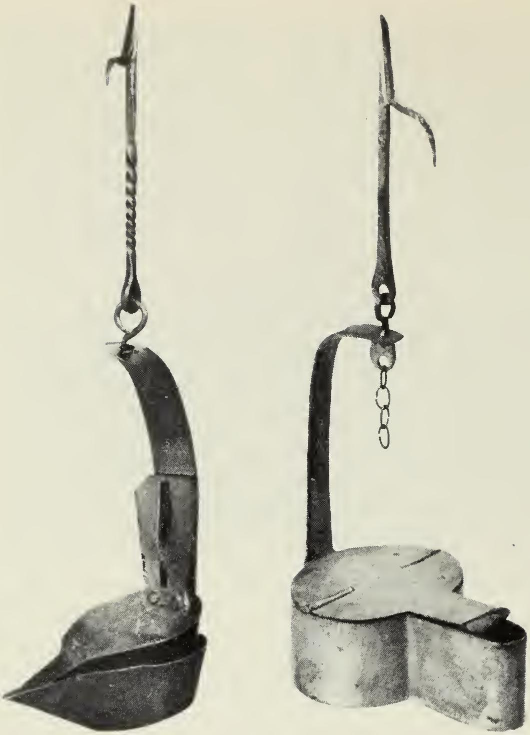
As whale fishing declined, and spermaceti grew expensive, a new candle substance took its place. This was stearine, manufactured from animal or vegetable fats. Stearine candles came on the market in the 1830s, and were mostly imported from England. After 1860, paraffin wax, manufactured from petroleum, became the common material for candles and has remained so ever since. But in the rural areas of Upper Canada, where money was scarce, the home-made tallow candle continued in use long after the much better stearine or paraffin article had become available in the shops.

In England an even cheaper substitute for the candle was devised. This was the rushlight. Apparently it was also used in New England in the 18th and early 19th centuries, and there is at least one record of it in what is now southern Ontario. The rushlight was made by peeling most of the cortex from the stem of the common or soft rush, which is not the same as the familiar bullrush. The pith, with a little of the fibre to hold it together, was dipped in melted grease. Cut into lengths of six to ten inches, it could be burned in a rushlight holder, a kind of clamp of iron or brass, which held the burning piece of rush at about a 45° angle.

WHAT were crusie and betty lamps?

A family of lighting devices, found all over the world, may be grouped together as pan lamps. In its simple form a pan lamp is a shallow dish, perhaps only a clam shell, with some oil or grease for fuel, and a bit of twisted fibre at one side for a wick. In one form or another it has been invented independently at many times and in many places. The stone lamp of the Eskimo, part stove, part lighting device, is one version. The ornamented pottery lamps of Greece and Rome were refinements of the earlier clay saucer lamp. About the time that North America was being settled, pan lamps made of iron were common in western Europe. Two forms were brought to Upper Canada.

The crusie was a narrow oval dish, pointed at one end, and with a curved handle at the other. The pointed end supported the wick, and there was usually a little spike for moving the wick to the best height. A link attached to the upper end of the handle was connected to a hook or spike for hanging the lamp. Crusies burned animal fat, either lard or tallow, which melted as the flame warmed the pan. For a good flame the wick had to project above the rim of the pan, and this might result in some oil drip; to catch this a second pan of the same shape often was employed. One advantage of crusies was that they cast some light downwards without tilting, as would be necessary with a candle. They could be used, for example, to inspect the contents of a cooking pot without danger of spilling tallow into the



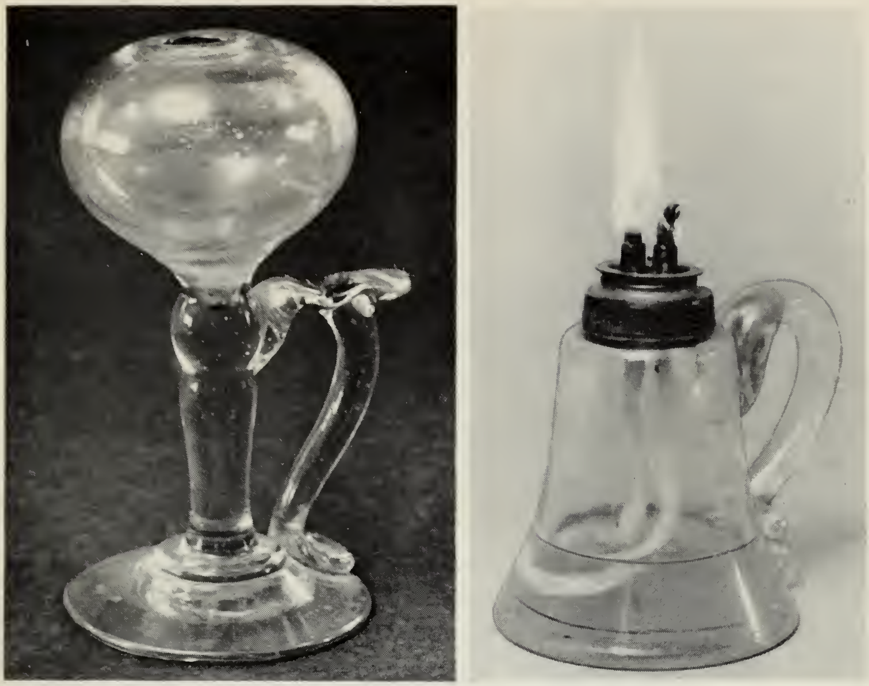
LEFT *The crusie was little more than an iron version of clay lamps used in Palestine before the birth of Christ. The narrow end supported the wick. The pan held lard or tallow which served as fuel.* RIGHT *The betty lamp, with its hinged lid, was apparently used in Ontario as late as the 1840s. It was usually made of sheet metal.*

food. Perhaps for this reason crusies usually hung from the mantel over the fireplace.

Crusies are known from the Markham district, but they are more common in Quebec than in Ontario. The betty lamp seems to have been more characteristic of Upper Canada. The betty differed from the crusie in having a separate trough for the wick inside the rim of the pan, thus eliminating dripping. In most examples the pan was covered by a lid, which was in two parts separated by a transverse hinge. This allowed the front part of the lid to be tilted up to permit filling. The tip of the pan, adjacent to the wick trough, was left uncovered. Examples are known that were used in the Port Colborne area, at Beamsville and at Thamesville. There is a tradition that betty lamps came to Upper Canada from Pennsylvania. No one knows for sure how they got their name, but as good a guess as any is that it came from the German *Bette*, the old form of the word for bed. The betty lamp, unlike the crusie, could be used as a bedroom lamp without danger of spillage.

WHERE did the pioneers get lamp oil?

The first lamp oil, at least in North America, came from whales, and was



LEFT *The glass fuel chamber and base of an early whale-oil lamp. The metal burner was set into the hole at the top; there was no thread to hold it in place.*
RIGHT *Most whale-oil lamps had two wick tubes, because experiments had shown that two flames close together give more light than the same two flames well separated. This "agitable" lamp, with a threaded collar, is actually burning whale oil.*

one of the most important products of the great 18th and 19th century whaling industry. Whale-oil lamps were the grand-daddies of all of the later oil and fluid lamps. In fact, to an Upper Canada settler of the 1790s, the word lamp would have had no other meaning. The whale-oil lamp usually consisted of a blown-glass receptacle, more or less globular in shape, with a half-inch hole in the top. Into this hole was set the burner, a small metal disc pierced by one or two metal tubes about one-quarter inch in diameter. The tubes projected upward about half an inch, and down about one inch. Through these tubes the wicks were threaded, with a quarter of an inch projecting free at the top. The lower part of the wick was immersed in the oil, which more or less filled the lamp. Sometimes the oil-container was made of tin or pewter instead of glass, but the burners were interchangeable. Early in the 19th century some models were introduced in which the burner was set tightly into the lamp by being screwed into a metal collar. This innovation was developed from the "agitable" lamp invented by an Englishman, John Miles. If such a lamp were knocked over the oil would not be spilled, as there was only a tiny hole for air to pass through the burner.

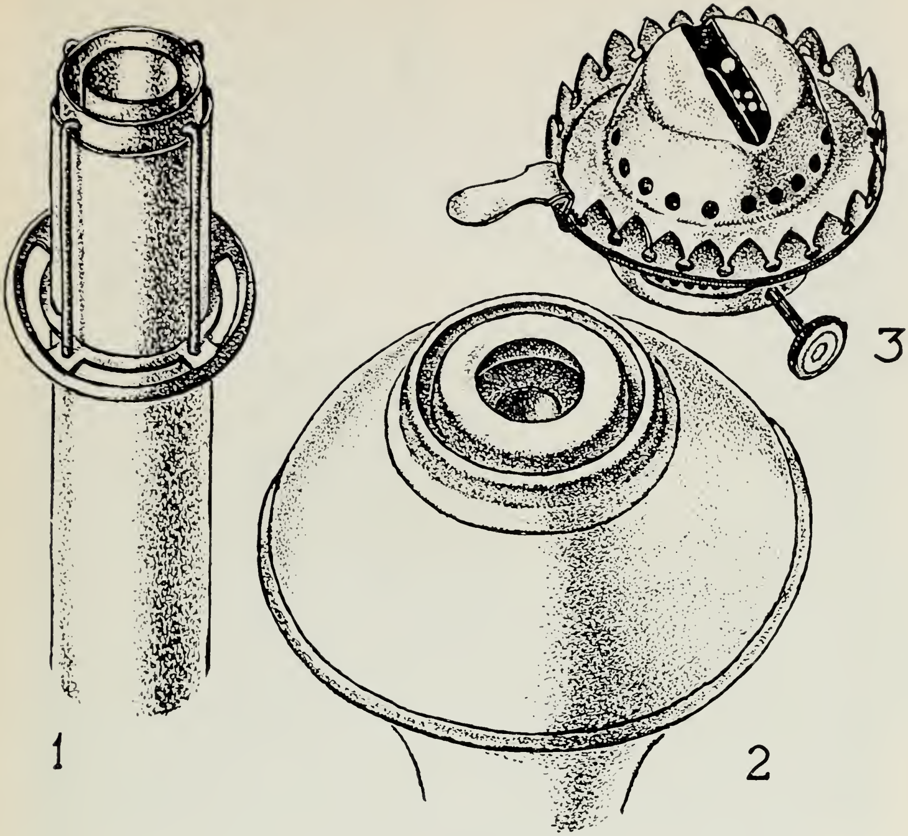
Even simpler was the float lamp. Here the burner was set in a piece of cork. A glass jar or goblet was half filled with water, and whale oil was poured on top. The burner was floated on this oil, and the wicks burned brightly until all the oil was used. Lamps of this sort were commonly used as night lights, because they would be sure to be extinguished by the water when the oil was consumed or if the lamp were knocked over. Curiously, this lamp has been revived in recent years for decorative purposes.

Whale oil came in two forms—the ordinary, sometimes called black oil or train oil, which was obtained from the baleen whale, and sperm oil, which was derived from the sperm whales of the southern oceans. Sperm oil was the better lamp fuel but was more expensive. Whale oil was sold in three grades, depending on the time of the year at which it was strained or pressed. In cold weather the thicker parts would tend to congeal, and winter-strained oil would therefore consist of the more fluid parts. Spring-strained oil would be of medium viscosity, and summer-strained oil would be the thickest, quite unsuitable for use in cold weather. Nearly all the whale oil used in British North America in the early 1800s came from the United States. However, seal oil from Newfoundland could be used instead, and was sold in Upper Canada for this purpose. Other oils sometimes available here for lamps were olive oil, imported from Europe, and colza oil, obtained by pressing cabbage seed.

Why was better lighting demanded?

By the 1830s the older centres of settlement in Upper Canada were becoming prosperous communities, and people in them were finding more leisure time for literary and social activities. Also a new class of settler was coming in. Some were officers of the British Army, retired in their prime on half-pay. Others were the younger sons of good families, sent to the colony "to seek their fortune". All, misfits or not, were people of education, and some were authors whose works added much to the cultural level of the colony. Such people knew that better means of lighting existed, and sought to acquire them for the evening hours spent in reading or writing.

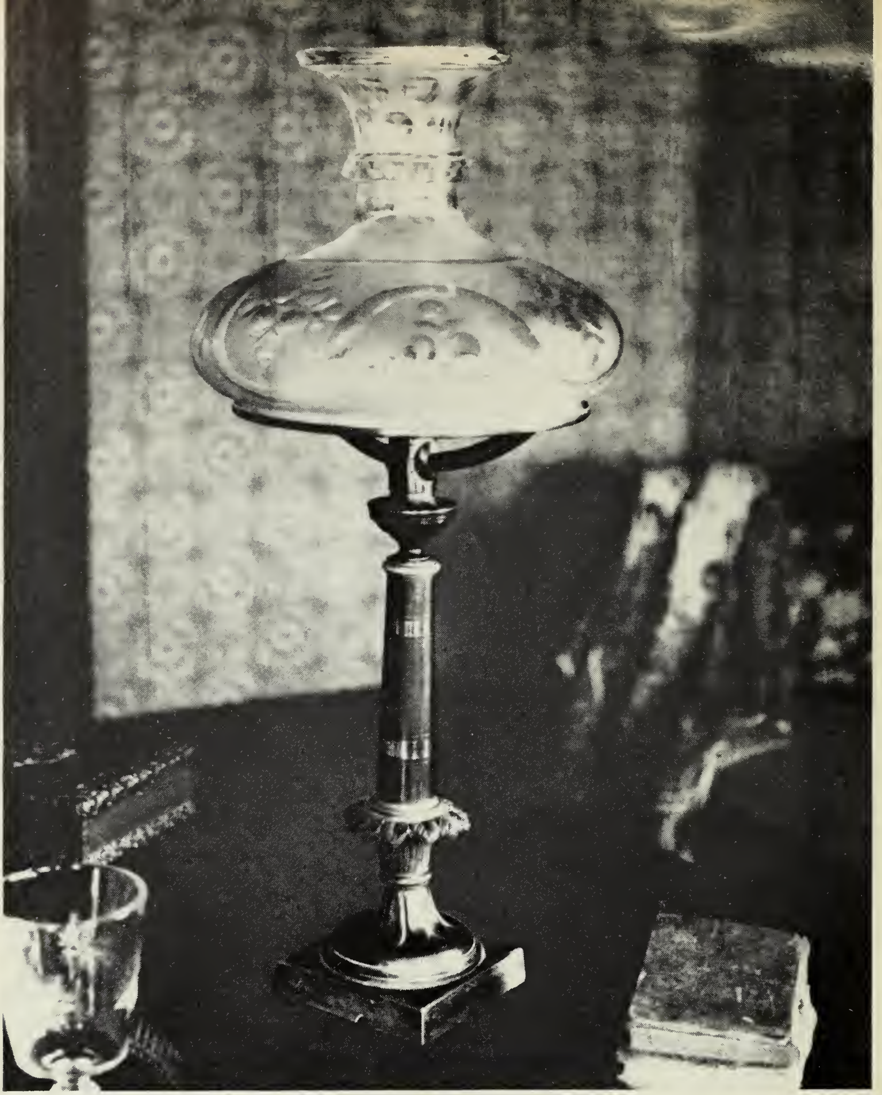
The first new lamps to appear in Upper Canada still burned whale oil but were designed to operate on the scientific principle of Ami Argand. They had a tubular wick supported by two metal tubes, one inside the wick and one outside. By arranging the oil container or font around, rather than under, the burner, it was possible to admit air to the bottom of the inner wick tube, and so provide a draft for the inside of the ring-shaped



Scientifically designed lamp burners were introduced in the middle decades of the 19th century. 1. Astral burner. 2. Solar lamp. 3. Pre-Confederation kerosene burner.

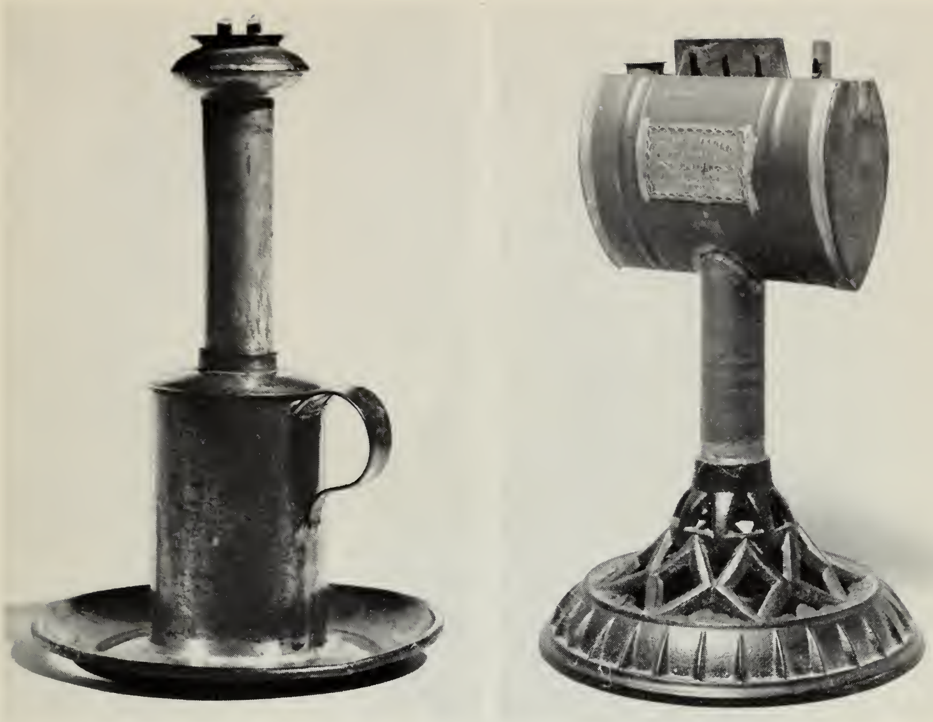
flame as well as the outside. Most of these lamps were of the type called astral, a French invention in which the font was ring-shaped and well separated from the burner. This allowed the light to come down from the flame between burner and font—hence astral or light from above. An English improvement was called the sinumbra (shadowless) lamp, because the font was wedge-shaped in cross-section and cast almost no shadow. Such lamps were certainly used in Canadian homes about 1840, and probably earlier. Most were handsome objects, with tall slender stems and broad glass shades curving gracefully to a narrow, chimney-like top.

The New England whaling industry began to decline in the 1840s and the price of whale oil gradually increased. Soon it was beyond the reach of the ordinary family and less expensive means of home lighting were sought. Lard had been used in the crusie and betty lamps; now an effort was made to design more convenient devices that would burn this substance



The sinumbra lamp combined an efficient burner and an elegant appearance. By the 1840s lamps were becoming decorative parlour furnishings.

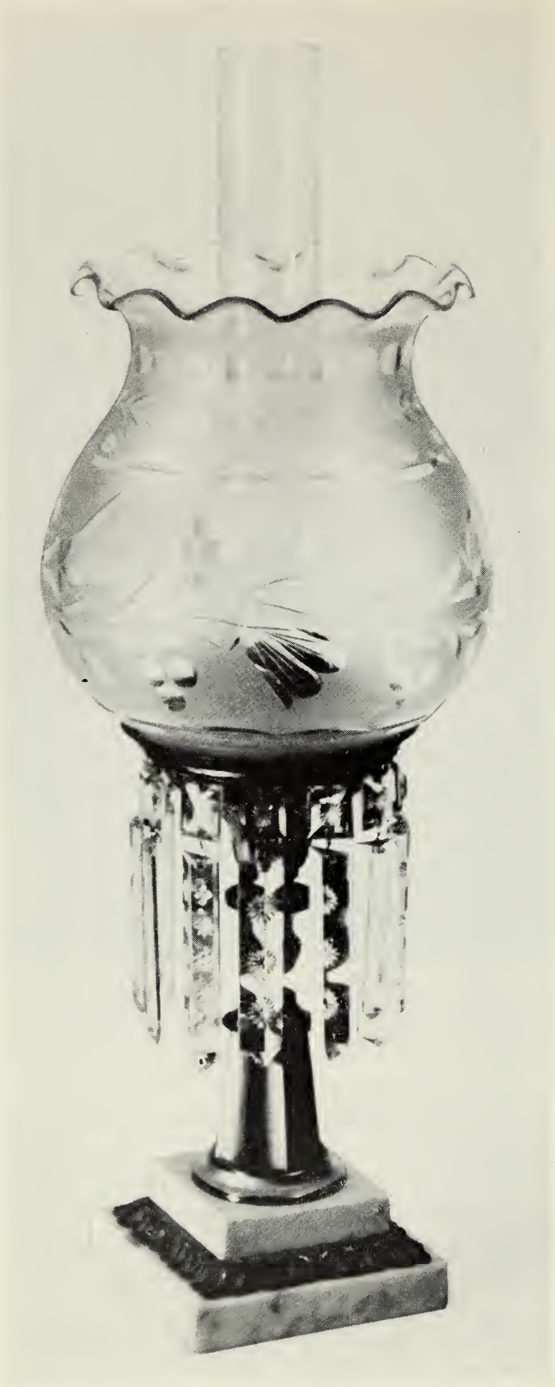
with a bright flame. Lard was never likely to be expensive in a land where almost every farmer raised pigs. But lard is solid at ordinary temperatures, and lamps that would burn it successfully had to have some special means of making it flow. In the Maltby and Neal lamp, invented in 1842, the wick tubes were mounted in a cylinder which acted as a plunger into the font. As the lard was consumed, the plunger was pushed down, forcing more lard up and around the wick tubes. Here some heat from the flame would warm the fat enough to allow it to flow up the wicks. The Kinnear lamp, invented in 1851, depended entirely on the heat conducted to the lard from the broad, flat wick tube. There was a small auxiliary burner to serve as a



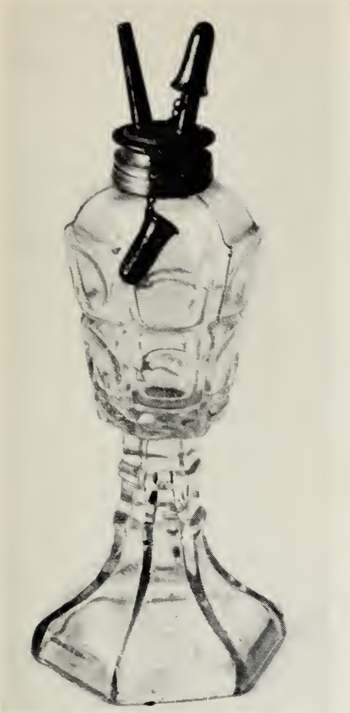
Both these lamps burned lard. LEFT *The Maltby and Neal model, with wicks mounted in a moveable plunger.* RIGHT *The Kinnear lamp, with fixed wicks surrounded by the fuel reservoir. The small single burner at the right end could be used as a night light.*

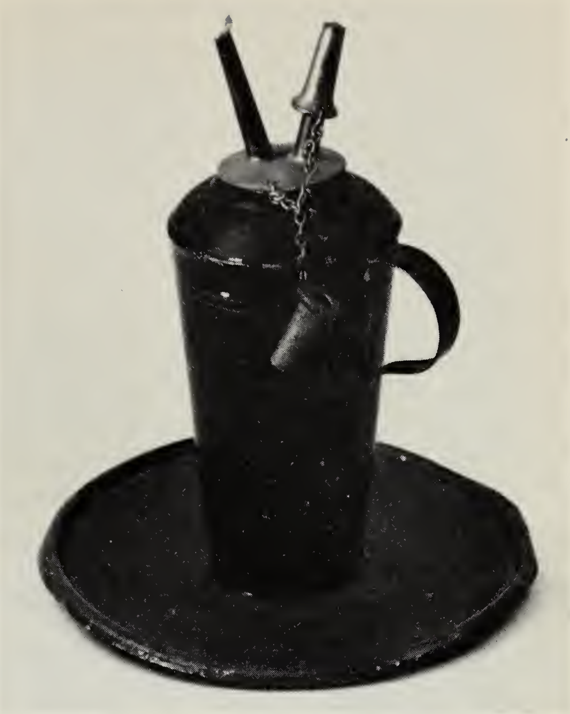
night light and to keep the lard fluid enough so that the main wick could be relighted without difficulty in the morning. From the number of examples still existing in collections it is evident that these lamps were widely used in their day. A Maltby and Neal lamp from a Markham Township home is illustrated, and a Kinnear lamp from the Belleville district is in a private collection at Napanee.

Most lard lamps were anything but elegant, being made of tin and painted in drab colours. A handsome lamp, suitable for the parlour of the better homes, was the solar lamp, most examples of which were manufactured by Cornelius of Philadelphia. Solar lamps were offered for sale in Toronto in 1847. Like the astral, they had a tubular burner, and are often mistaken for the earlier form. There were two important differences. The fuel font in the solar lamp was not a separate ring, but was like a vase immediately surrounding the burner. Heat from the flame thus warmed the fuel, which if it were lard would melt enough to flow up the wick. The



LEFT *Solar lamp—another thrifty lard-burner—could grace any parlour with its etched glass globe and pendent prisms.* RIGHT *"Burning fluid", a highly dangerous but popular fuel mixture of alcohol and turpentine, demanded a special form of lamp, which might be of glass or tin. The twin flames had to be snuffed out: blowing on them turned the lamp into a blowtorch. The caps also served to prevent evaporation when the lamp was not in use.*





other distinctive feature was the deflector, a low metal dome over the wick, with a hole in the centre just big enough for the flame. This forced the draft onto the flame, intensifying it and causing it to shoot upward as a high narrow cone. To further intensify the draft there was a tall, narrow chimney. With these functional parts there was a gracefully shaped glass globe, a handsome golden bronze finish, and perhaps a ring of prism-shaped glass pendants. In spite of its plebeian fuel, the fine appearance and good performance of the solar lamp made it a favoured parlour item between 1845 and 1855, but it required careful cleaning after each use. Otherwise the flame would be feeble, with an unpleasant-smelling smoke.

Another popular lamp fuel about the same time was "burning fluid", often called camphene or camphine. This was 95% alcohol in which some spirits of turpentine were dissolved. Like lard, burning fluid was cheap, but in almost every other way it differed. Instead of being thick, it was very fluid. It was not a home product but had to be bought from a manufacturer or dealer. Lard was a very safe fuel, but burning fluid was highly dangerous. Many people were injured or even killed in explosions and fires resulting from its use. Lamps designed for burning fluid had to isolate the fuel in the font from the heat of the flame, whereas lard lamps had arrangements to transmit this heat.

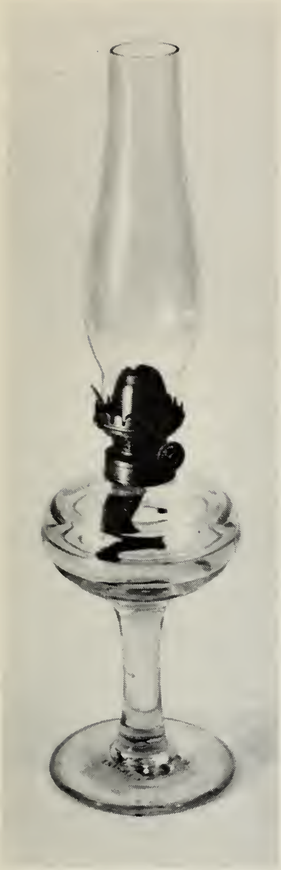
The common burning-fluid lamp was a glass vessel into which was screwed a metal burner having two wick tubes. There was thus some resemblance to the simple whale-oil lamp. The tubes, however, were high, tapering, and diverging, and did not project down into the font. The latter was made of thick moulded glass instead of thin blown glass, and was tall and narrow. All this was intended to keep the flame away from the fuel, prevent build-up of vapour, and reduce the danger of breakage. Some burning-fluid lamps were made of tin instead of glass. Many of the glass lamps had elaborate pressed designs, and are much sought today by collectors.

The flame of the burning-fluid lamps is said to have been bright and clean. With precautions they were probably safe enough. But people allowed them to become overheated, or knocked them over while in use, or even, believe it or not, tried to refill them while they were still burning. Even after kerosene became the almost universal lamp fuel in the 1860s, burning fluid was still being sold in Canada West.

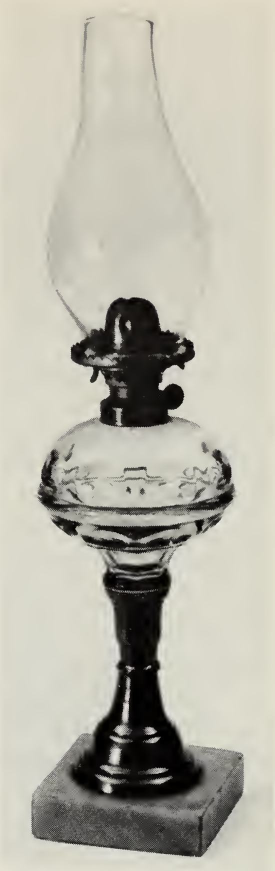
WHO was responsible for the kerosene lamp?

The origin of the kerosene lamp is somewhat obscure. It seems to have been an American improvement of an Austrian invention based on a French idea. On the other hand the discovery of kerosene is well known. It began with the production of illuminating gas through the distillation of coal. One of the residues was coal tar, from which chemists were able to prepare a number of useful compounds. Some of these were discovered by Michael Faraday, including the light oil called benzole. Attempts to use benzole as a lamp fuel were not too successful. Eventually, however, it was discovered that by distilling the coal at a temperature lower than that used in gas ovens a thin oil was obtained that gave an excellent light when burned in a suitable lamp. This discovery was made independently by Dr. Abraham Gesner, a physician and geologist of Halifax, Nova Scotia, and James Young, a Scottish chemist working in Manchester, England. Gesner's experiments seem to have begun earlier, and he gave public demonstrations of his new lamp fuel in 1846; but Young patented his "paraffine oil" in 1850 and 1852, whereas Gesner did not get a patent for "kerosene", as he named it, until 1854.

Gesner's kerosene was first on the market in North America, and by 1857 was being offered for sale in Toronto. It was expensive compared with lard or burning fluid, so in spite of its safety and convenience it did not become popular at once. In 1859, however, petroleum was obtained from wells dug or drilled into the earth, and before long kerosene distilled from petroleum was plentiful and cheap. The two main oil fields in those



Kerosene lamps ushered in a new era of safety, convenience and brightness in the 1850s. LEFT *An all-glass model with a globular font, manufactured before petroleum had developed as a cheap source of kerosene.* RIGHT *A composite design with a metal stand and marble base. Both lamps were used in Toronto homes before Confederation.*



days were in northwestern Pennsylvania and southwestern Ontario. The first Canadian oil refinery was set up in Hamilton in 1860, and soon others followed in the Toronto area. Kerosene dropped in price to about 25 cents a gallon; at that price even the backwoods settler could afford at least one "coal-oil" lamp. At first the Canadian kerosene had a sulphurous smell when burning, but the producers soon learned to purify it so that it could compete with the best from Pennsylvania.

Most of the kerosene lamps in Ontario before Confederation and for some years afterwards were imported from the United States. There were two kinds, which were already in use before the petroleum era. One of these was made entirely of glass except for the burner and the collar into which it screwed. The other was composite, with a glass font, a brass stem, and a marble base. The all-glass lamps either were low and conical, with a glass handle, rather like some whale-oil lamps, or had a globular font supported by a glass stem and base. Most were made by the process known as mould-blowing, in which the glass is blown inside a metal mould; lamps made in this way are usually thick, and show only two faint mould seams on the sides. In composite lamps the glass font was turnip-shaped, and was made by pressing the glass in a mould of three or more pieces. Elaborate patterns could be pressed into the surface of the glass; sometimes, moreover, the glass was pressed in two layers of different colours, and a decorative pattern subsequently cut through the outer layer, creating a very handsome appearance. This method of decoration was called overlay. At the bottom of the font was a glass plug, which was set into an ornamented brass tube and this in turn was bolted to the base. In early lamps this base was a square slab of marble, but in the later 1860s an ornate casting in black or white opaque glass was commonly used.

The kerosene lamps of the 1850s and early 1860s all had much the same kind of brass-plated metal burner. A flat, woven wick projected through a tube of the same shape, and could be raised or lowered by rotating a toothed wheel which pressed against it. The most characteristic feature was the dome-shaped deflector, much higher than in the solar lamp, and with a slit-shaped, rather than circular, opening. The glass chimney was held in place by a coronet-like rim around the burner, helped in some cases by a wire spring or a set screw. The four springy prongs which hold the chimney in the familiar kerosene burner were not invented until 1868, so any burner with these is definitely post-Confederation in date. Chimneys in these early lamps were relatively tall and narrow, plain at the top, and turned out a little at the bottom to provide a better grip for the chimney holder.

WHEN was gas introduced?

Coal gas for heating and lighting was introduced in the larger Canadian towns, such as Montreal, Kingston and Toronto, in the 1840s. Because of the elaborate equipment needed for manufacture and distribution, however, it was not available in the small centres or rural areas. The light from the gas flame, resulting from incomplete combustion, was very yellow. Many years passed before the brilliant white light of the Welsbach gas mantle was available. In pre-Confederation days gas lighting was restricted to public places, such as halls and theatres, and the wealthier urban households. For these lucky users, very elaborate chandelier-style gas fittings, decorated with etched globes and glass prisms, were designed to hang from the ceilings. In the cities gas was immensely popular. But in the back lines, and even along the less wealthy parts of “the front”, the people of Ontario a century ago still depended on candles and kerosene lamps to light their homes.

SUGGESTED READING

DARBEE, H. C. "A glossary of old lamps" (*History News*, American Association for State & Local History, vol. 20, no. 8, technical leaflet 30, August 1965)

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O'DEA, W. T. *The social history of lighting* (Routledge and Kegan Paul, London, 1958)

THWING, L. *Flickering flames: A history of domestic lighting through the ages* (Charles E. Tuttle Co., Rutland, Vt., 1958)

WATKINS, C. M. *Artificial lighting in America: 1830–1860* (Smithsonian Institution, Annual Report 1951, pp. 385–407)